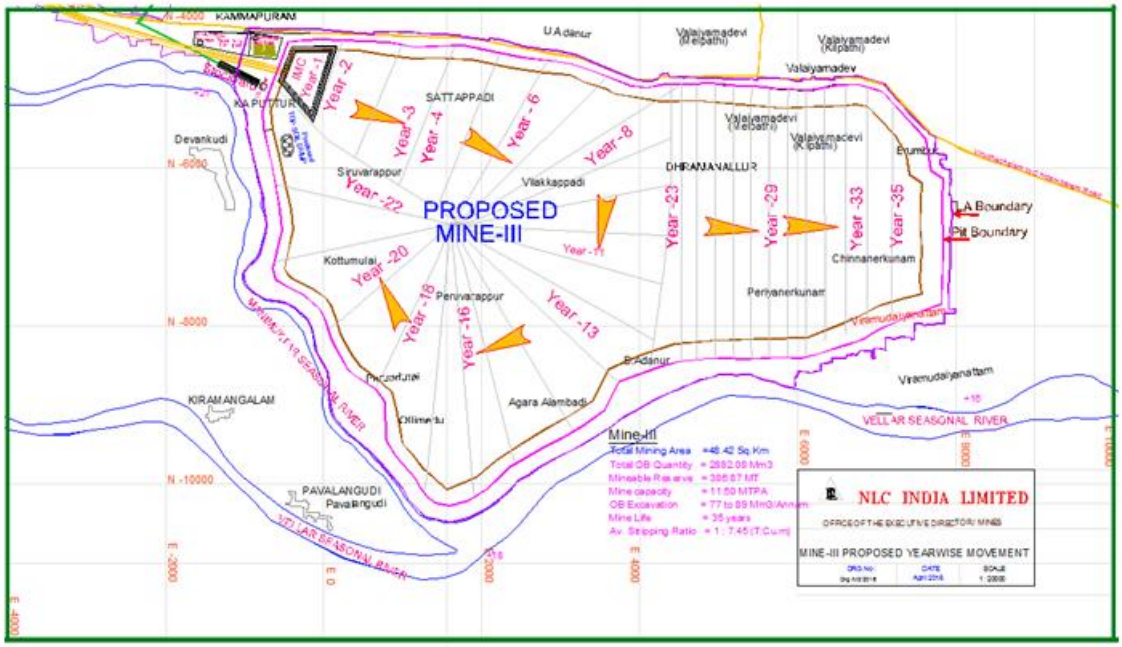
MINE-III

PRE-FEASIBILITY REPORT
11.50 MTPA



PRE-FEASIBILITY REPORT

NLC INDIA LTD, LIGNITE MINE-III (11.50 MTPA)

1.0 EXECUTIVE SUMMARY

The salient features of the project are given below:

<table>
<tr><td>Project name</td><td>NLCIL, Lignite Mine-III (11.50 Million Ton per Annum)</td></tr>
<tr><td>Project proponent</td><td>NLC India Ltd</td></tr>
<tr><td>Villages in the Mine area</td><td><u>Spread of Mining area in part / full of the following villages:</u>
Chinna Nerkunam, Ko.Adhanur, Peruvarapure, Perundurai, Ottimedu, Valayamadevi Kilpathy, Kottumulai, Siruvarapur, Puthur, Sathappadi, Agaraalambadi, B-Adhanur, Dharmanallur, Periyanerkunam, Vilakkapadi, U-Agaram, Erumbur, Valayamadevi Melpathy, U-Adhanur, Gopalapuram, Kammapuram, Su-Keenanur, Kumaramangalam, Veeramudaiyanatham, U-Kulappakkam, Arasakuzhi.</td></tr>
<tr><td>Latitude/ Longitude</td><td>
<table>
<tr><th colspan="3">Mine –III, Area</th></tr>
<tr><th>Code</th><th>Latitude</th><th>Longitude</th></tr>
<tr><td>1</td><td>11° 28’ 30.84”</td><td>79° 26’ 17.84”</td></tr>
<tr><td>2</td><td>11° 28’ 10.27”</td><td>79° 30’ 36.28”</td></tr>
<tr><td>3</td><td>11° 26’ 37.47”</td><td>79° 31’ 05.76”</td></tr>
<tr><td>4</td><td>11° 25’ 07.60”</td><td>79° 27’ 43.19”</td></tr>
<tr><td>5</td><td>11° 26’ 49.88”</td><td>79° 26’ 20.59”</td></tr>
<tr><th colspan="3">External Dump Area</th></tr>
<tr><td>A</td><td>11° 31’ 49.06”</td><td>79° 24’ 24.44”</td></tr>
<tr><td>B</td><td>11° 30’ 0.37”</td><td>79° 22’ 42.30”</td></tr>
<tr><td>C</td><td>11° 29’ 14.56”</td><td>79° 24’ 05.95”</td></tr>
</table>
</td></tr>
<tr><td>Total Mine project Area</td><td>The proposed Mine project area is 4841.99 Ha.</td></tr>
<tr><td>Present Land use break up</td><td><u>As per Tamilnadu govt. Land classification:</u>
<table>
<tr><td>As per Tamilnadu Govt.Land classification</td><td>Area in Ha</td></tr>
<tr><td>Forest Land</td><td>0.00</td></tr>
<tr><td>Irrigated Land (patta lands):</td><td>1275.52</td></tr>
<tr><td>Un irrigated Land (Dry):</td><td>2804.01</td></tr>
<tr><td>Cultivable Waste (Govt. Tharisu) :</td><td>25.21</td></tr>
<tr><td>Common facility (Govt.Poramboke):</td><td>622.86</td></tr>
<tr><td>Earmarked for Housing:</td><td>114.39</td></tr>
<tr><td>Total land:</td><td>4841.99 Ha</td></tr>
</table>
</td></tr>
<tr><td>Reserve</td><td>Geological Reserves = 440.88 Million Ton
Extractable Reserves = 386.87 Million Ton</td></tr>
<tr><td>Rated capacity</td><td>11.50 MTPA</td></tr>
</table>

Life of the mine	35 years
Stripping ratio (Average)	7.45:1 m^3:t
Method of Mining	Opencast - Shovel dumper equipments
Overburden quantity	2882.02 Mm^3
Blasting (Hard strata alone)	Slurry explosives
Storage of explosives	Magazine
Working days	365 days/year (3 shifts of 8 hour each)
Manpower	Manpower: About 300 persons Exact Manpower requirement will be evaluated during Feasibility Report Finalization.
Transportation	The Run–of–Mine Lignite will be transported by conveyor belt to the proposed Pit Head Thermal Power station Thermal –II 2nd expansion (1320 MW).
Expected cost of the project	Approximate capital cost of the project is Rs 1150 Crores. Exact Capital cost of the project will be evaluated during Feasibility Report Finalization.
Elevation	25 m to 15 m above mean sea level (msl)
Topography	Flat

2.0 INTRODUCTION OF THE PROJECT / BACKGROUND INFORMATION

2.1 Identification of the project and project proponent. In case of mining project, a copy of mining lease / letter of intent should be given

2.1.1 Identification of the project and project proponent

NLC India Limited, (NLCIL) formerly (Neyveli Lignite Corporation limited) is Navaratna, a Government of India Enterprise registered under Indian Companies Act, 1956, engaged in commercial exploitation of the Lignite deposit available at Neyveli region. The Neyveli Lignite Corporation was formed as a Corporate Body in 1956 under the Government of India, a Public Sector Undertaking (PSU) functioning under the Administrative control of the Ministry of Coal. NLCIL operates the open-pit lignite mines in India.

Mining of lignite seam first started in 1962 in Neyveli , situated in Cuddalore District about 200 km South of Chennai in Tamilnadu. NLCIL has been a pioneer company in lignite mining for more than five decades and operates the open-cast mechanized lignite mines in India.

NLCIL is engaged in commercial mining of the Lignite deposit available at Neyveli region in Tamil Nadu as well as in Rajasthan. Four lignite mines having a combined production capacity of 30.6 MTPA feeding lignite to thermal power stations having a combined generating capacity of 3240 MW. NLCIL is operating 1000 MW Coal based Thermal Power Station as joint venture project with NLC Tamilnadu Power Limited. The t**otal power generating capacity of NLCIL is 4240 MW.** In addition, NLCIL is also supplying lignite (1.9 Mt/y) to an Independent Power Plant (TAQA) of 250 MW generation capacity.

A New Neyveli Thermal Power Station (NNTPS) of 1,000 MW generation capacity at Neyveli is proposed as a replacement for the existing TPS-I of 600 MW. The NNTPS power plant is under construction. Bithnok TPS (1X250MW) linked with Bithnok lignite Mine (2.25 MTPA) and Barsingsar TPS Extension (1X250 MW) linked with Hadla lignite Mine (1.9 MTPA) are under execution.

In the Non-Conventional Energy Sector, 51 MW wind power project and 10 MW Solar Power Project has been commissioned in Tamilnadu while another 130 MW at Neyveli is under implementation stage.

NLCIL has signed a JV agreement with UP Government to establish a 1980 MW Power Station (3 x 660MW) at Ghatampur, Uttar Pradesh and the project is at the execution phase. The **Table - 1** shows NLCIL existing operating Mines with capacity, the **table-2** shows the existing NLCIL operating thermal power plant and **table-3** depicts the operating renewable energy of NLCIL.

TABLE-1

EXISTING NLCIL OPERATING UNITS

Sr. No	Existing Mine	Lignite Production capacity per annum in MT
1	Mine-I at Neyveli, Tamilnadu	10.5
2	Mine-IA at Neyveli, Tamilnadu	3.0
3	Mine-II at Neyveli, Tamilnadu	15.0
4	Barsingsar, Rajasthan	2.10
	Total	**30.60**

TABLE-2

EXISTING NLCIL OPERATING THERMAL POWER PLANT

Sr. No	Thermal Power Plants	Capacity in MW
1	Thermal power plant-I at Neyveli, Tamilnadu	600
2	Thermal power plant-I Expansion at Neyveli, Tamilnadu	420
3	Thermal power plant-II at Neyveli, Tamilnadu	1470
4	Thermal power plant-II Expansion at Neyveli, Tamilnadu	500
5	Barsingsar Thermal Power Station, Rajasthan	250
6	Neyveli Tamilnadu Power Limited at Tuticorin, Tamilnadu (Coal based)	1000
	Total	**4240**

TABLE-3

EXISTING NLCIL OPERATING SOLAR & WIND POWER PLANTS

Existing NLCIL Renewable Energy Power units		
Sr.No.	Power Units	Capacity in MW
1	Solar Power Plant at Neyveli, Tamilnadu	10 MW
2	Wind power plant at Tirunelveli District, Tamilnadu	51 MW
Total Renewable Energy Power plant capacity		**61 MW**

2.12 Identification of Project

NLCIL in its 448th Board meeting has approved for taking up Advance Action Proposal for Mine-III (11.50 MTPA) with fuel linkage to the Proposed Thermal Power Station-II 2nd Expansion (2 x 660 MW Super -critical Thermal power station) at Neyveli. Form-I & PFR Details has been submitted to MoEF&CC on 30.11.2016 for the linked 1320 MW Power project (Proposal No: IA/TN/THE/60765/2016) and other Thermal stations of NLCIL.

2.1.3 Copy of mining lease / letter of intent should be given

Copy of composite Lease document of Neyveli Lignite Field (259 Sq.km) is enclosed as **Annexure-I**

2.2 Brief description of nature of the project

The proposed Project area for Mine-III project is envisaged as 4841.99 Ha which includes mine area, external dump area and infrastructure. In addition 489.43 Ha land is envisaged for formation of Re-settlement centres for displaced people. The external dump area of about 688 Ha has been identified for initial stages of external dumping until sufficient voids are developed in mine pit. The lignite will be extracted at the rate of 11.50 MTPA at peak capacity (100%). The life of mine is 35 years. The geological lignite reserve in the selected mining block is 440.88 Million Tonne and the minable reserve of the block is 386.87 MT.

Due to soft nature of formation (sedimentary formation) as envisaged earlier Open Cast Mining method will be adopted by deploying Conventional Mining Equipment (CME) comprising of Shovel/Backhoes & rear discharging dumpers for removal of waste and lignite production.

2.3 Need for the project and its importance to the country and or region

Next to coal Lignite is the only fossil fuel which is abundantly available in India. About 90% of the lignite reserves is found in Tamilnadu and it will be prudent to utilize this Lignite deposit to the best advantage to the nation. The concept of locating the Thermal power plants closer to the pit-heads was recognized by the Govt. during the third plan period not only for economic reasons but also for relieving the railways of congestion in goods traffic. In states, where fuel resources were available, pithead generation became the obvious choice.

The lignite based power plants at Neyveli has several advantages as detailed below:

(i) Availability of adequate reserves of lignite of almost consistent quality

(ii) The ash content of lignite is very low (3 % to 7%) compared to coal from Talcher coal field (40%). Lignite ash is less corrosive than coal ash and therefore the lignite fired boilers is much more advantage than coal fired boilers.

The southern Region comprises the States of Andhra Pradesh, Karnataka, Tamil Nadu, Kerala and Puducherry. The Southern Region has, since long, been facing a power deficit both in terms of energy and peaking capacity. Lack of availability of sufficient electric power has always been one of the greatest deterrents to the growth of industry in the

Southern Region (Andhra Pradesh, Karnataka, Kerala, Tamil Nadu and Puducherry) and remarkable growth and progress of the country have led to an extensive use of electricity.

The anticipated peak demand and energy requirement for power in Southern Region by the end of Twelfth plan (2012-13 to 2016-2017) is projected to be 60,433 MW and 38,006 MU respectively. As Tamil Nadu State is the most preferred State for industrialization, the industrial demand for power will be ever increasing. Added to the industrial demand, the agriculture need as well as domestic consumption coupled with the improved standard of living of the population will be on the rise.

Taking all these into consideration, establishment of the new technology lignite fired power plant is justified in all aspects, since the project will meet a part of the projected power demand.

To feed Lignite to the proposed Thermal Station – II 2nd Expansion project (1320 MW), it is proposed to commission Mine-III at 11.50 MTPA capacity. Huge lignite resources available in this region could be recovered with the excellent experience of the NLCIL. The Lignite would be used for Power generation. The power generation will help for our country's Industrial, Social and Agriculture development

2.4 Demand-supply gap:

2.4.1 Power Demand and Supply Analysis

"Power sector Report" as per CEA website gives the details of power supply position. The details at 12th plan end, from year 2002-03 to 2015-16 for All India is given in Table 4.0 and for Southern region and Tamilnadu are given in Table 5.0.

TABLE-4.0 YEARWISE DEMAND SUPPLY

Period	Peak Demand (MW)	Peak Met (MW)	Peak Deficit/ Surplus (MW)	Peak Deficit/ Surplus (%)	Energy Require-ment (MU)	Energy Availa-bility (MU)	Energy Deficit/ Surplus (MU)	Energy Deficit/ Surplus (%)
9th Plan End	78441	69189	-9252	-11.8	522537	483350	-39187	-7.5
2002-03	81492	71547	-9945	-12.2	545983	497890	-48093	-8.8
2003-04	84574	75066	-9508	-11.2	559264	519398	-39866	-7.1
2004-05	87906	77652	-10254	-11.7	591373	548115	-43258	-7.3
2005-06	93255	81792	-11463	-12.3	631757	578819	-52938	-8.4
2006-07	100715	86818	-13897	-13.8	690587	624495	-66092	-9.6

2007-08	108866	90793	-18073	-16.6	739343	666007	-73336	-9.9
2008-09	109809	96785	-13024	-11.9	777039	691038	-86001	-11.1
2009-10	119166	104009	-15157	-12.7	830594	746644	-83950	-10.1
2010-11	122287	110256	-12031	-9.8	861591	788355	-73236	-8.5
2011-12	130006	116191	-13815	-10.6	937199	857886	-79313	-8.5
2012-13	135493	123294	-12159	-9.0	998114	911209	- 86904	- 8.7
2013-14	135918	129815	-6103	-4.5	1002257	959629	-42428	-4.2
2014-15	148166	141160	-7006	-4.7	1067085	1028955	-38130	-3.6
2015-16	153366	148463	-4903	-3.2	1114408	1090851	-23557	-2.1
April 2016 – Sept. 2016	159243	158059	-1185	-0.7	589621	585450	-4171	-0.7

Table – 5.0 DEMAND SUPPLY OF SOUTHERN REGION

Description	**Unit**	**Southern Region**		**Tamilnadu**	
		Sept., 2016	**April 2016 – Sept., 2016**	**Sept., 2016**	**April 2016 – Sept., 2016**
Peak Demand	MW	40654	40923	14424	14823
Peak Availability	MW	40592	40592	14385	14823
Peak surplus/ deficit	MW	-61	-331	-39	0
Peak surplus/ deficit	%	-0.2	-0.8	-0.3	0.0
Energy Requirement	MU	24689	150791	8675	54428
Energy Availability	MU	24686	150477	8674	54419
Energy surplus/ deficit	MU	-3	-314	-1	-9
Energy surplus/ deficit	%	0.0	-0.2	0.0	0.0

According to **Table 5.0**, during April, 2016 – September, 2016, Southern Region has peaking shortage of 331 MW i.e. (-) 0.8% & Energy shortage of 314 MU i.e. (-) 0.2% and Tamilnadu State has energy shortage of 9 MU with no surplus power. At all India Level, the peaking shortage is

0.7% & Energy deficit is (-) 2.4% respectively. Table 6.1, 6.2 & 6.3 shows the Installed capacity of Power Generation at all India level, Southern Region and Tamilnadu State as on 31.10.2016.

Table-6.1: Installed capacity of Power Generation - All India level as on 31.10.2016

Sector	Thermal				Nuclear	Hydro	RES** (MNRE)	Total
	Coal	Gas	Diesel	Total				
State	63580.50	7210.70	363.93	71155.13	0.00	28341.00	1975.40	101471.53
Private	71652.38	10355.60	554.96	82562.94	0.00	3120.00	43941.55	129624.49
Central Sector Share	51260.00	7490.83	0.00	58750.83	5780.00	11651.43	0.00	76182.26
Total	**186492.88**	**25057.13**	**918.89**	**212468.90**	**5780.00**	**43112.43**	**45916.95**	**307278.28**

RES** = Renewable Energy Sources

Table-6.2: Installed capacity of Power Generation at Southern Region

Sector	Thermal				Nuclear	Hydro	RES** (MNRE)	Total
	Coal	Gas	Diesel	Total				
State	16882.50	791.98	287.88	17962.36	0.00	11668.03	512.55	30142.94
Private	8270.00	5322.10	554.96	14147.06	0.00	0.00	19765.27	33912.33
Central Sector Share	11890.00	359.58	0.00	12249.58	2320.00	0.00	0.00	14569.58
Total	**37042.50**	**6473.66**	**842.84**	**44359.00**	**2320.00**	**11668.03**	**20277.82**	**78624.85**

Table-6.3: Installed capacity of Power Generation at Tamilnadu State

Sector	*Thermal*				*Nuclear*	Hydro	RES** *(MNRE)*	*Total*
	Coal	*Gas*	*Diesel*	*Total*				
State	4770.00	524.08	0.00	5294.08	0.00	2182.20	122.70	7598.98
Private	2950.00	503.10	411.66	3864.76	0.00	0.00	9995.20	13859.96
Central	4155.10	0.00	0.00	4155.10	986.50	0.00	0.00	5141.60
Total	**11875.10**	**1027.18**	**411.66**	**13313.94**	**986.50**	**2182.20**	**10117.90**	**26600.54**

Tables – 7.0 shows the details of peak load requirement of Southern region and Tamilnadu as per 18th Electric Power Survey a publication of CEA. As the peak demand

and energy requirement of the Southern Region and the state of the Tamilnadu are mainly involved, as such for the power demand and supply analysis of the above said three Regions have been considered.

Table-7.0 Peak Electric Load at Power Station Bus Bars (MW)

YEAR	SOUTHERN REGION	TAMILNADU
2011-12 (11 Plan End)	37599	12813
2016-17 (12 Plan End)	57221	20816
2021-22 (13 Plan End)	82199	29975
2026-27 (14 Plan End)	118764	43044
2031-32 (15 Plan End)	165336	59827

From the Table-7.0, it will be seen that peak load requirement will be on a rising trend for the southern region & the state of Tamilnadu.

To bridge the gap between demand and supply, generation of additional capacity is required. The proposed project has been considered for the effective utilization of existing infrastructure and water. Further, the proposed TPS will have the advantage of economy of scale in reducing the cost of generation by adopting Super-critical Technology.

Hence, to supply Lignite to the proposed TPS, the establishment of Mine-III Lignite opencast Mine project is justified.

2.5 Imports vs. indigenous production

There will not be any import for the proposed Mine-III.

2.6 Export possibility

There will not be any export of lignite from the proposed mine.

2.7 Domestic / export markets

There will not be any export from the mine as the entire lignite will be used for the Thermal Power Plant –II 2nd Expansion 1320 MW (2X660 MW) of NLCIL.

2.8 Employment generation (direct and indirect)

There will be direct employment for about 300 persons. There will be indirect employment in the outsourced operation of Mining activities. The further detail about employment will be submitted after completion of feasibility report.

3.0 PROJECT DESCRIPTION

As a part of NLCIL's determined growth plan, it proposes to start an Opencast Lignite Mine in Mine-III Block located 23 km south of Neyveli Township at Neyveli area, Tamil Nadu. It is proposed to open the mine with mining capacity of 11.50 Mt/y (Peak mine capacity). The Lignite and Overburden excavation will be carried out through outsourcing option with CME Technology. The fuel linkage from this Mine-III will be given to Thermal-II 2nd expansion with a capacity of 1320 MW (2X660 MW). The Mine project life shall be 35 years.

3.1 Type of Project with Linked Project:

The lignite from this open cast mine will be utilized for power generation in Thermal Power Station-II 2nd expansion 1320 MW (2X660 MW) of NLCIL Ltd, in Neyveli.

3.2 Location with coordinates

Mine-III block in Neyveli Lignite Field is bound by Virdhachalam – Chidambaram road in the north, seasonal river Manimuktha in the west, seasonal river Vellar in the south. The Eastern limits are extending upto north of Veeramudaiyanatham and south of Erumbur / Ukkadai. The Manimuktha seasonal River joins with Vellar seasonal River near Kudalaiyathur. The mining lease area and study area falls in the Survey of India Topo sheet No.58 M/7&11 and bounded by following co-ordinates

Mine –III, Area		
Code	**Latitude**	**Longitude**
1	11° 28' 30.84"	79° 26' 17.84"
2	11° 28' 10.27"	79° 30' 36.28"
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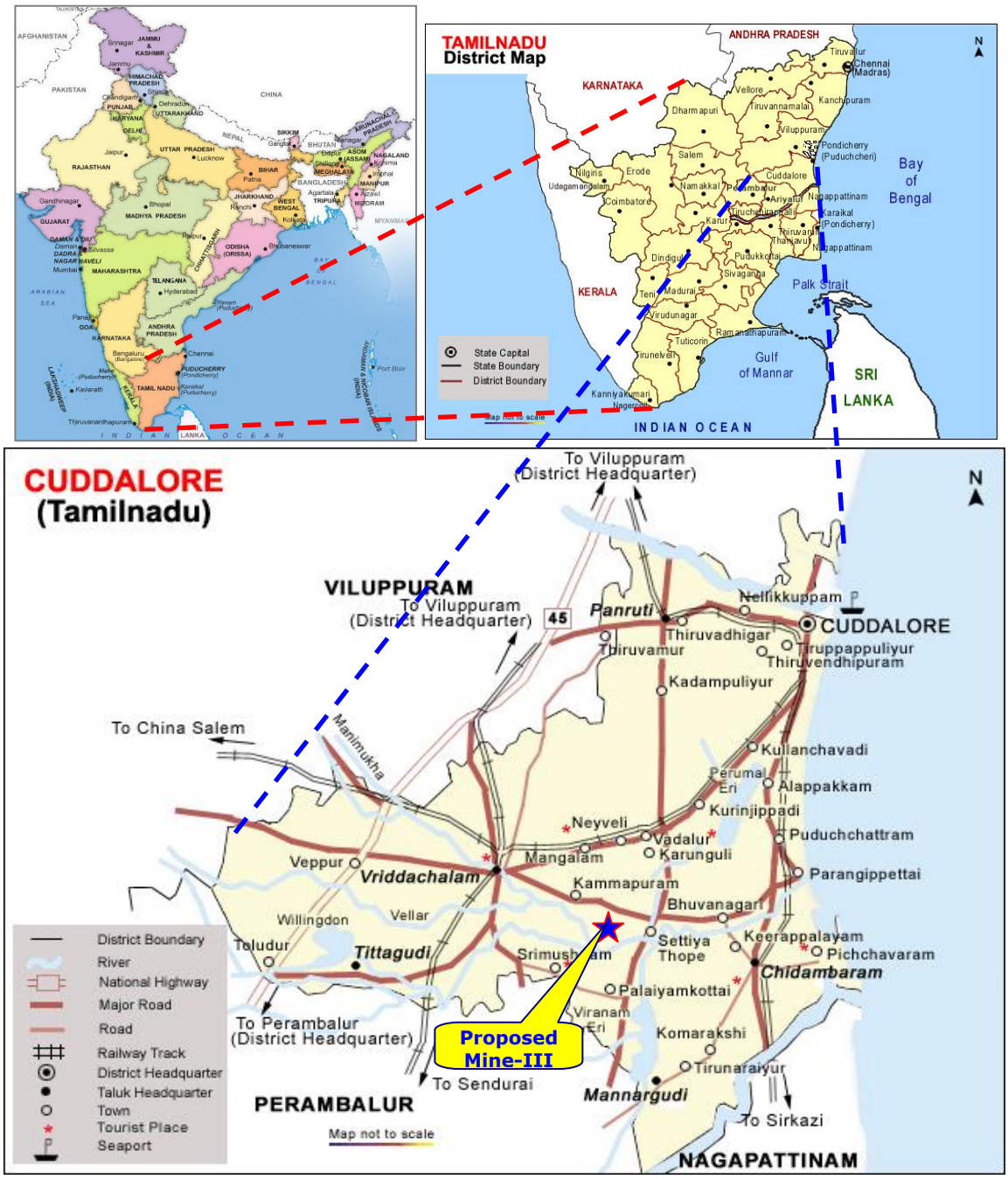
The Index Map of Mine-III project is given below:

INDEX MAP OF PROPOSED MINE



3.3 Details of alternate sites & Environmental considerations and Basis of selecting the proposed site:

Lignite deposition is site specific and mining in this area is inevitable. Hence, no alternate site could be considered. To feed Lignite to the proposed 1320 MW pit head Thermal Power Station project, the site is selected.

3.3.1 Environmental Considerations and Protection Measures:

NLCIL gives greater importance for environmental considerations and protection measures in the project. NLCIL will ensure that the proposed mine causes no adverse impact on the area. The proposed project is planned to meet all environmental norms and further improve the environment in the area by means of scientific reclamation and afforestation.

3.4 Size or magnitude of operation

The proposed Project area for Mine-III project is envisaged as 4841.99 Ha which includes mine area, external dump area and infrastructure. Minimum depth of proposed Mine is 55m and maximum depth of Mine is 130m. In addition, 489.43 Ha land is envisaged for formation of Re-settlement centres for displaced people. The proposed Resettlement centre is 15 Km away from project area. The lignite will be extracted at the rate of 11.50 MTPA at peak capacity. The quantity of Waste removal will be about 77 to 89 Mm^3/annum. The operation is proposed to be carried out with CME Technology. Mine life will be for about 35 years and total overburden removal will be about 2882.08 million m^3.

3.5 Project description with process details (a schematic diagram/ flow chart showing the project layout, components of the project etc. should be given)

3.5.1 Physiography of the project:

The proposed Mine-III Block is at located 23 km south of Neyveli township at Neyveli area, Tamil Nadu. This lignite Field is continuous extension of the existing Mine-II. It is bounded by Vridhachalam – Chidambaram road in the north, seasonal river Manimuktha in the west, seasonal river Vellar in the south. The Eastern limits are extending upto north of Veeramudaiyanatham and south of Erumbur / Ukkadai.

The Neyveli area is an extremely gentle topographic region. It is a flat alluvial plane topography. The general range of elevation in the Mine-III block varies from 23.00m to 15.00m above MSL. The drainage in this area is mostly controlled by the seasonal river Manimukthar in the west, the seasonal river Vellar in the south and also by rivulets and channels which ultimately drains into these seasonal Rivers.

The mine block is demarcated based on surface constraints and depth of the mine. Mine block extends from 100 metres south of present Chidambaram-Vridhachalam road, the western and southern boundaries are limited leaving 200metres from Manimukthar and Vellar respectively. The Eastern limits are extending upto north of Veeramudaiyanatham and south of Erumbur / Ukkadai.

3.5.2 Geology of the Area:

In the present context of mining, it can be said that Geology governs the occurrence, deposition, the limits of lignite deposition and the Geological study inter-alia help in the

nature and characteristics of overburden formations and associated strata. In fact, the design/planning of the mining operation such as site status, mine size, slope, ramps, blasting, excavation, dumping, backfilling etc, depend on the prevailing geological conditions with their implications on the environment. Geologically, the demarcated mining area and the surrounding area belong to the Upper Miocene age of the Tertiary era. The sequence of the geological formation in the mining area and on a regional basis is given **Table-8** below:

TABLE-8 STRATIGRAPHY OF NEYVELI AREA

Era	**Period**	**Stage**	**Lithology**
Cainozoic	Quaternary	Pleistocene to recent	Alluvial clay and sands, laterite with reddish brown ferruginous clayey soil
	Tertiary	Cuddalore Formation-Mio-Pliocene (Early Neogene)	Mottled, fine to coarse grained yellowish to brownish grey ferruginous sandstone
		Neyveli Formation - Eocene	Sandstone , clay, carbonaceous clay, lignite, beds, aquifer, sand and clay
		Niniyur Formation Palaeocene (Palaeogene)	Lime stone, calcareous shale /mud. Clay and sandstone
Mesozoic	Cretaceous	Ariyalur Group	Argillaceous and micaceous sandstone with bands and lenses of limestone. Clay sandy clay and siltstone with fine grained argillaceous sandstone
Palaezoic	Lower Permian	Lower Gondwana	Boulder bed, conglomerates, olive green to khaki coloured shale with pink sandstones
Archaean		Gneissic Group	Pink migmatite granitoid gneiss

A brief account of the Formations intersected in the boreholes drilled by MECL is furnished in the following **Table-9**.

TABLE - 9

FORMATIONS INTERSECTED IN BOREHOLES IN MINE-III BLOCK

Formations	General Range		Predominant Range		Lithology
	Min,	Max.			
Soil	0.5	3	1	2	-
Quaternary Formation	18	36	26	30	Alluvial clay/ Sandy clay, sand /Argilacious.sand
Tertiary Formation	42	166	70	140	Clay,sandy clay, sand, Sandstone (argilacious) mostly variegated and lignite.
Semi-confined aquifer above lignite	0.8	12	4	9	Sand
Lignite	4	20	8	18	-
In burden	0	13.7	2	9	Clay,carbclay,silty clay sand, Argi. Sand / Sst

Formations	General Range		Predominant Range		Lithology
	Min,	Max.			
Confined aquifer below lignite	10.9	32.10	29.0	32.0	Sand, Argi.sand

3.5.3 LIGNITE SEAMS AND ITS DISPOSITION

The lignite occurs mainly as main (Composite) seam in most of the area. In some locations development of local seam above main seam are noticed at two places thickness ranges from 0.5m to 1.2m. The main seam thickness ranges from 3.5m to 22m. The lignite seam below the main seam is named as bottom seam and its thickness ranges from 1m to 4 m. The general trend of the lignite seam is observed as ranging between NNE-SSW and NE-SW. The general gradient of lignite seam is observed to be around 1 in 85 towards East-Southeast.

The lignite seam occurs at a depth range of 47.20 m to 154.00 m, depth range of lignite seam from surface increases gradually from west to east with minor variations.

3.5.4 Reserves & Quality of Lignite:

The Geological Reserve of the Mine-III block is 440.88 MT and mineable Reserve is 386.87 MT. The selected pit is based on the requirement of Reserve base to support 11.50 Mt/ annum mine for about 35 years.

The Reserve details and basic Project Parameters of the proposed Mining block are given in the **Table-10**.

TABLE-10

LIGNITE RESERVE & BASIC PROJECT PARAMETERS

Sr. No.	Parameters	Unit	Value
1	In-situ Geological Reserves of Mine-III block	Mt	440.88
2	Geological Loss considered for any unexpected thinning or washout of lignite (10%)	Mt.	44.09
3	Balance Geological reserves (1-2)	Mt	396.79
4	Geological reserves locked up below benches/ batter & Mining Loss (2.5%) of (3)	Mt	9.92
5	Extractable / Mineable Reserves (3-4)	Mt	386.87
6	Volume OB	Mcum	2882.08
7	Stripping ratio	t/ cum	1: 7.45
8	Target Capacity at 100% capacity	Mt/annum	11.50
9	Project/ Mine Life	Years	35

The grade/quality of lignite is expressed in terms of CV (K.Cal./Kg). A summarized account of the quality of lignite in Mine-III block is tabulated in **Table-11.**

TABLE-11

QUALITY OF LIGNITE IN MINE-III BLOCK

Sr. No	Analytical Parameter	General Range		Dominant Range	
	Proximate Analysis (Weighted average)	**Minimum**	**Maximum**	**Minimum**	**Maximum**
1.	Moisture %	45.0	58.3	48.0	55.0
2.	Ash %	2.1	9.2	3.1	8.0
3.	Volatile Matter	20.7	27.7	21.0	27.0
4.	Fixed Carbon	14.6	24.5	16.0	22.0
5.	Calorific Value	2280	3307	2400	3000
6.	Bulk Density	1.12	1.19	1.14	1.17

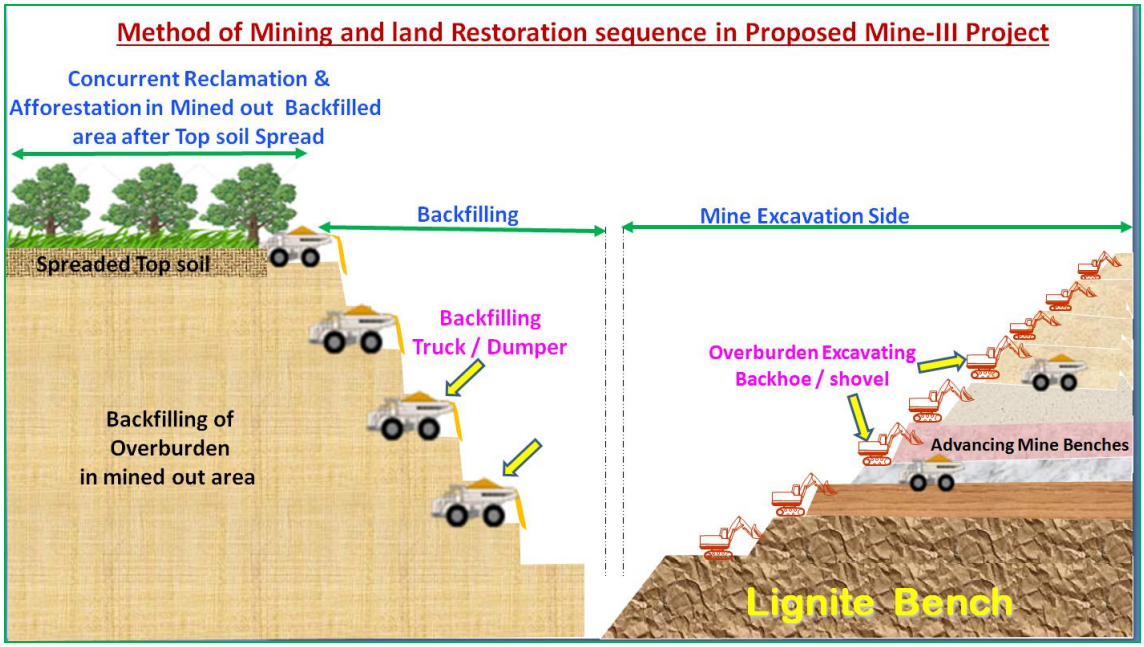
3.5.5 LIGNITE TO OVERBURDEN+INTERBURDEN RATIO

The average Lignite:OB+IB ratio is 1:7.45 T:m^3. The Lignite:OB+IB ratio in general varies from 1:3.8 to 1:19.7 and most of the area falls within 1:10 ratio limit. The ratio of 1:>10 occurs along the southern, eastern and central portion of the block. However, few patches are noticed in the center of the block also which is solely due to thinning of seam. The probable reason for thinning are raised floor, quality deterioration and partial washout. The favourable depth ratio of less than 1:6 is noticed in the northern and north western portion of the block.

NLCIL has more than 5 decades of proven experience in lignite mining technology. Considering the geo-mining characteristics of the deposit, the mine is proposed to be an open cast mine working with Shovel/Backhoe -dumper system. Being a proven technology, operating experience will ensure reliable lignite supply to TPSs and thereby reliable electricity production. The mining schedule is designed to match NLCIL's lignite requirements.

3.5.6 Schematic Diagram explaining Mining Method:

The general Mining method practiced at Neyveli is shown in the picture. In Mine-III project, shovel will be deployed in the advancing benches. The excavated overburden will be spread back by using dumpers in the mined out area as shown in the picture below. Top soil will be stored separately and spread over back filled area. The backfilled area will be biologically reclaimed and afforested to restore to pre-mining condition.



3.5.7 Selection of Mining Field:

The Mine-III block is demarcated by Vridhachalam- Chidambaram road at North, by Manimuktha Seasonal River in at West and South-west and by Vellar seasonal River at South. The Eastern portion of the block becomes narrow due to Vridhachalam road and Vellar seasonal River on North and South side respectively.

Exploration for estimation of lignite reserves has already been done by GSI, NLC and MECL. 256 Boreholes in Mine-III area considered for reserve estimation.

3.5.8 Delineation of Mine Boundary & Surface Considerations and Constrains:

The following considerations have been made for the assessment of Mining boundary.

i. The seasonal streams, Manimukthar in the west and velar in the south are form a surface boundary constraint. The surface mine boundary is kept at a distance of about 200m from the banks of the seasonal Rivers. An embankment of 3m above the HFL height is proposed 45m from the surface boundary as a protection from the banks of the seasonal rivers for the safety of mining operations.

ii. The Mine boundary at the North is fixed by leaving a safe zone of 100m from Vridhachalam-Chidambaram road and it is not proposed to realign / shift the above highway. The distance is sufficient for providing protective bund /drainage , approach road, safety zone etc along the road.

iii. Lignite Iso-ratio plan for various cut-off ratios viz 1:10, 1:15, 1:20 were generated and adjusted. Mine boundary options at an overall slope angle of 28^{o} on the above cut-off ratios were studied.

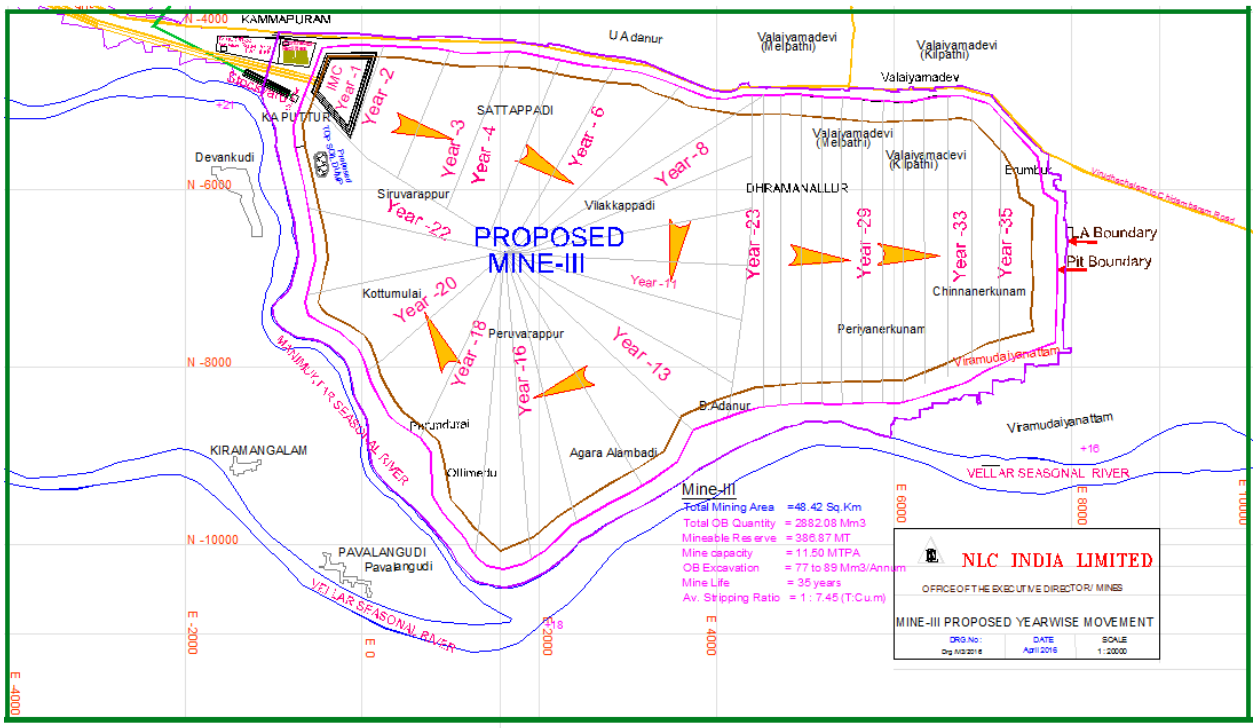
In fine, for selecting the mine boundary, the following factors are taken into considerations:

a) Minimum thickness of lignite seam 0.5 meters
b) Calorific value not less than 2000 Kcal/Kg
c) Leaving safe distance of 100m from Vridhachalam –Chidambaram road in the North
d) Leaving safe distance of 200m from Manimukthar seasonal River and Vellar seasonal River

The overall pit slope angles of 28^{o} if slope height is >100m and 30^{o} if slope height is <100m, respectively are followed in the existing NLCIL mines in Neyveli. In line with the above, it is proposed to have an overall pit slope of 28^{o} for Mine-III for freezing the mine boundary.

3.5.9 Sequence of mining

Continuous opencast mining method by deploying CME Technology comprising of Shovel/Backhoe & rear discharging dumpers is being adopted. They are most effective where overburden depths are greater than 50m and the Coal / lignite seams are thicker.

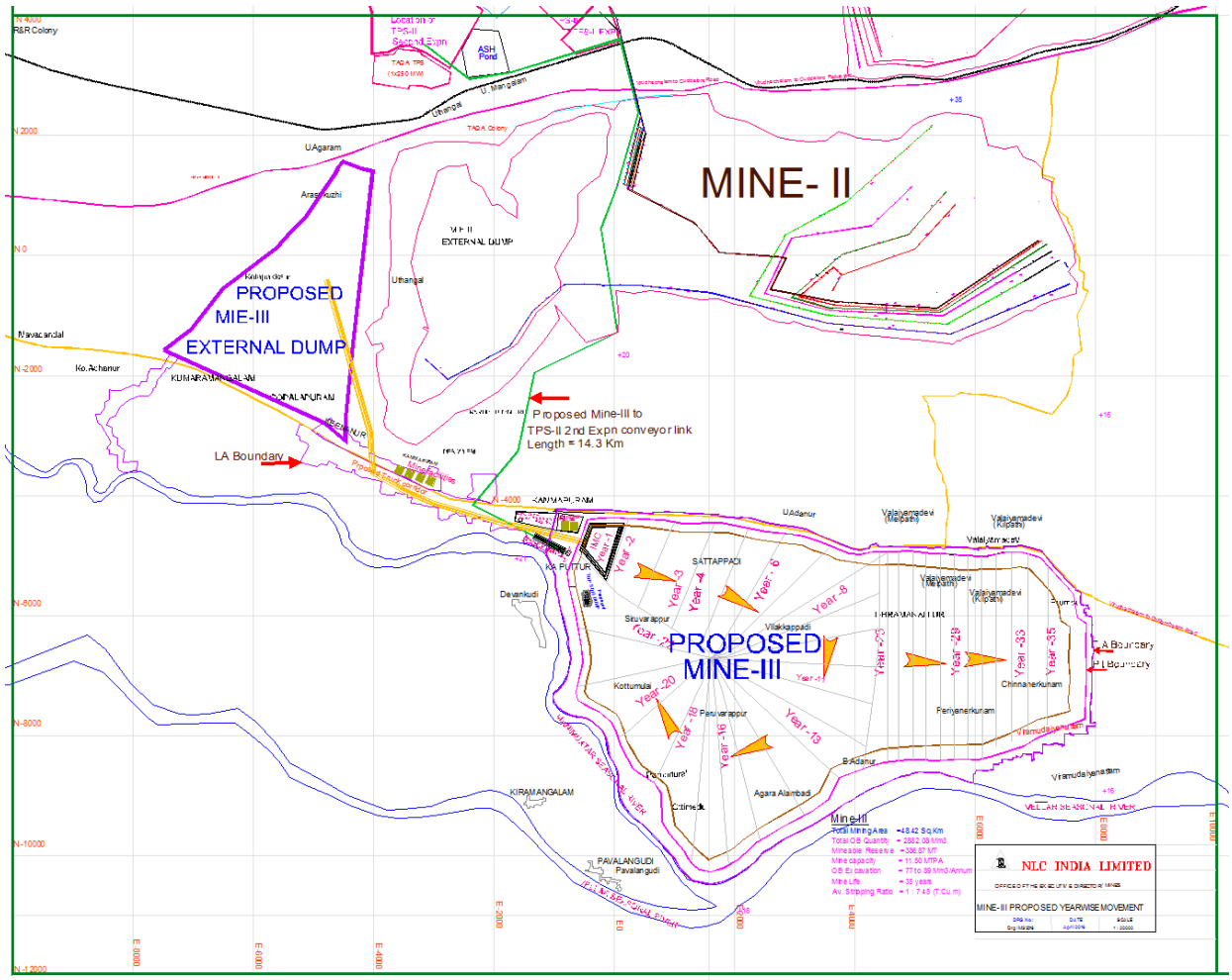


Plan showing sequence of Mining operation in Proposed Mine-III

It is proposed to first open up the mine by Initial Mining Cut (IMC) in the selected pit. It is proposed to start IMC from North-west side of the pit between boreholes no. EVI -64 and EVI -60. The roof of the lignite horizon will be touched near the borehole EVI-10 at a depth of about 54 m.

The Mining will start from the North-West side in IMC of the Mine-III area and proceed towards East. The initial cuts will run approximately North-South and will begin along the West wall in the North-west corner of the mine area and will include the construction of

haulage ramp in the North-west corner. A haul road of 20m width has been proposed up to the floor of lignite horizon. The average gradient of haul road will be 1 in 20.



YEARWISE MOVEMENT PLAN OF MINE-III WITH EXTERNAL DUMP YARD

The waste material for the initial development will be transported from the pit via this ramp to the external waste dump located North-West of the Mine pit. The mine advance will be parallel to the Mid limit as shown in the above plan. The mining direction will swing around the pivot point of bore hole location of borehole no. NLE-43. and progressing into a NS direction. During the year 23, the Mining operation will be commenced from the mid area and moving towards east. The mine will run in parallel to North-South direction till the end of Mine touching the eastern boundary limit of mine pit. The reason behind this planning is to achieve a fairly homogeneous lignite production despite the thinning of the lignite seams in some area. The table-12 shows the Tentative Mine-III year wise Production schedule:

TABLE-12

TENTATIVE MINE-III YEAR WISE PRODUCTION SCHEDULE

Year	Overburden (Mm^3)	Lignite (MT)
1	46.05	0.0
2	77.00	8.75
3	77.0	11.50
4	77.0	11.50
5	77.0	11.50
6	77.0	11.50
7	77.0	11.50
8	77.0	11.50
9	77.0	11.50
10	77.0	11.50
11	77.0	11.50
12	87.0	11.50
13	87.0	11.50
14	87.0	11.50
15	87.0	11.50
16	87.0	11.50
17	87.0	11.50
18	87.0	11.50
19	87.0	11.50
20	87.0	11.50
21	87.0	11.50
22	87.0	11.50
23	89.0	11.50
24	89.0	11.50
25	89.0	11.50
26	89.0	11.50
27	89.0	11.50
28	89.0	11.50
29	89.0	11.50
30	89.0	11.50
31	89.0	11.50
32	89.0	11.50
33	89.0	11.50
34	89.0	11.50
35	41.03	10.12
Total	**2882.08**	**386.87**

The proposed sequence of mining will permit start-up of mining operations at minimum depth and at favourable stripping ratio along with consideration of safety of the mining operations. During year-1, the Initial Mining Cut quantity of the mine is about 46.05 Mcum of overburden. The exposure of Lignite will be in Year 2. The OB excavation during the year 2 to 11 would be about 77 Mm^3/Annum. The OB excavation during the year 12 to 22 would be about 87 Mm^3/Annum. The OB excavation during the year 23 to 35 would be about 89 Mm^3/Annum. The life of the Mine-III will be about 35 years at annual production rate of 11.50 MTPA.

This sequence of operations will ensure superior cash flows for the project as well as early back-filling of voids created during the course of mining operations. The adopted sequence also opens a limited mining front and reduces the transportation lead of dumpers for external & internal dumping.

3.6 Raw Material Required Along with Estimated Quantity, Likely Source, Marketing Area of Final Product's Mode of Transport of Raw Material and Finished Product

No raw material is required as this is a mining activity. Only diesel would be required for transportation of vehicles, operation of HEMM and generators in case of emergency. Lignite from Mine-III after weighing the trucks will be unloaded at insitu crusher to reduce the size less than 250 mm. From the crusher units the lignite will be transported to the lignite surface storage bunker by conveyor system. From the surface bunker, lignite will be transported to Power station through conveyor system. The overburden will be removed using shovels/backhoes and will be transported with a fleet of Rear discharging dumpers.

3.7 Resource Optimization/ Recycling and Reuse Envisaged in the Project

Resources like Explosives, Diesel Oil, Machinery, Land, Power and Water are fully optimized to minimize unnecessary losses during the process of excavation and supply of coal to the customers. The production capacity from Mine-III will be 11.50 Million Tonnes per annum at peak requirement. The lignite does not require beneficiation. The resources which are used in the mining will be recycled by various methods. Sludge generated from domestic wastewater treatment will be composted and used as manure. Spent oil from transformers, will be sold to the authorized vendors. The ground water pumped for safe mining will be used for drinking water and for thermal power generation in TPS-II 2^{nd} expansion. Mine sump water collected at settling pits shall be discharged from quarry through pumps and used for dust suppression, mining activity, irrigation to surrounding villages and also for TPS-II 2^{nd} expansion units after required treatment.

3.8 Availability of Water its Source, Energy / Power Requirement and Source

3.8.1 Water

The seepage water and the rain water collected in the mine sump will be utilized for industrial water required for washing, sprinkling on mine roads for dust suppression and

for watering the mine site plantations. The drinking water will be supplied from bore well and stored in overhead tank near the facilities area and distributed through pipe lines to different facilities area for drinking and domestic purposes. The drinking water requirement will be about 150 KLD.

3.8.2 Power

The incoming Power supply for Mine-III project is proposed to be availed from the nearest NLCIL Power source. Mine Sub Station 230/11 kV with two transformers of 2 X 30 MVA power is tentatively envisaged for Mine-III project.

3.9 QUANTITY OF WASTES TO BE GENERATED (LIQUID AND SOLID) AND SCHEME FOR THEIR MANAGEMENT / DISPOSAL

Solid waste:

The total overburden excavation in Mine-III project is 2882.08 Mm^3. For the initial six years, entire overburden quantity will be dumped in the external dumps. From 6th to 10^{th}year, part of the overburden material will be dumped in the internal pit of mine-III and the remaining quantity is planned to dump in Mine-II voids. From 11^{th} year onwards sufficient voids will be developed thereby accommodating entire OB in the internal pit of Mine-III. External dumping site has been selected in the no lignite bearing zone which is 5.0 km North –west of Mine-III having an area of 688 Ha.

During year-1, the Initial Mining Cut quantity of the mine is about 46.05 Mcum of overburden. The OB excavation during the year 2 to 11 would be about 77 Mm^3/Annum. The OB excavation during the year 12 to 22 would be about 87 Mm^3/Annum. The OB excavation during the year 23 to 35 would be about 89 Mm^3/Annum.

Overburden strata mainly consist of alluvium capping at top with argillaceous and ferruginous sandstone intercalated with bands of clays, sandy clays of variegated nature have been observed to envelop occasionally thin bands or lenses of hard and compact rock. Overburden volume excavation in Mine-III will be in the range of 77 to 89 Mm^3 per annum.

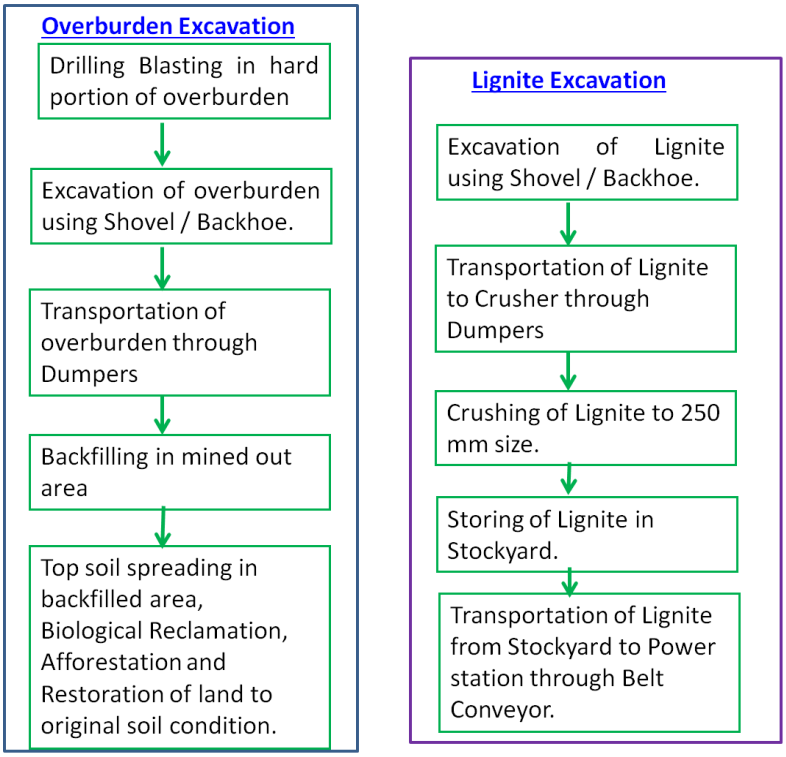
To accommodate the waste material, the external dumps will be elevated 60m above the surrounding ground. The waste dumps will be created in 20m decks. The overall slope of internal and external dumps will be maintained not exceeding 28^0. The external dump will be covered with Top soil and afforested. The internal dumps created by backfilling will be 5 m to 10 m higher than the original topography in most of the excavated area.

Liquid waste

The liquid waste generated in the mine like used engine oil, used gear oil, used brake oils and other lubricants are stored in separate drums/cans and sent to disposal through Govt. authorized recyclers.

3.10 Schematic Representations of the Feasibility Drawing Which Give Information of EIA Purpose

Schematic diagram showing the operation of OB & Lignite Excavation which give information of EIA purpose is shown below. These are the activities which are the source for Pollution. The pollution will be mitigated effectively.



Schematic diagram showing the operation of OB & Lignite Excavation

4.0 SITE ANALYSIS

The Mine site is present in Neyveli lignite field falling in Cuddalore district of Tamilnadu. The extent of the proposed mining project area is 4841.99 Ha. The study area falls in the Survey of India Topo sheet No.58 M/7& 58 M/11 and bounded by the Latitudes: 11° 25' 10" N to 11° 31' 42"North & Longitudes: 79° 22' 52" E to 79° 32' 55" East

4.1 Connectivity

Road

Neyveli Lignite Mine-III is well connected by roads to Chennai (230 Kms due North), Cuddalore (40 Kms due east), Kumbakonam (70 Kms South) and Vridhachalam (15 Kms West). All the villages within the ambit of exploration area are interlinked by asphaltic and metalled roads.

Railway Line

The nearest railway Station is Neyveli (7.8 Km North) which is located on the Cuddalore-Vridhachalam Section of Southern railway.

Air Link

The nearest International air port is at Tiruchirapalli at a distance of about 112 km.

4.2 Land Form, Land Use and Land Ownership

The land requirement for Mine-III lignite project is 4841.99 Ha. The entire area falls under the category of non-forest land.

The existing Land-use breakup and ownership of land (Govt/ Private) of the project is presented in the below **Table-13**.

TABLE-13
PRESENT LAND USE DETAILS

Sr.No	As per Tamilnadu govt. Land classification	Area in Ha
1	Forest Land	0.00
2	Irrigated Land (patta lands)	1275.52
3	Un irrigated Land (Dry)	2804.01
4	Cultivable Waste (Govt. Tharisu)	25.21
5	Common facility (Govt.Poramboke):	622.86
6	Earmarked for Housing	114.39
	Total land	**4841.99 Ha**

The post mining Land-use breakup of the project is shown in the below **Table-14**.

TABLE-14

POST MINE LAND USE BREAK-UP

Sr.No.	Post Mining Land use	Area in Ha
1	External OB Dump (Reclaimed with plantation)	688.00
2	Mine Backfilled area (Reclaimed with plantation)	3014.00
3	Mine Final void (Converted as Lake)	353.00
4	Green Belt (With plantation)	124.00
5	Infrastructure	153.49
6	Inspection Road around the Mine (With Avenue trees)	25.00
7	Intervening area (Brought under plantation)	139.50
8	Garland canal & Drainage	157.00
9	Safety Zone (Brought under plantation)	188.00
	Total land	**4841.99**

4.3 Topography

The surface contours of the area indicate a gentle topography with elevations varying mostly between +22 meters in the north-west and +15 meters in the south-east.

Drainage:

The drainage in this area is mostly controlled by the seasonal river Manimukthar in the west, the seasonal river Vellar in the south and also by rivulets and channels which ultimately drains into these seasonal Rivers.

4.4 Existing Land Use Pattern and Shortest Distances from the Periphery of the Project to Periphery of the Forest, National Park, Wild Life Sanctuary, Eco Sensitive Areas, Water Bodies, CRZ etc :

The existing Land use details of the project:

TABLE-15

PRESENT LAND USE DETAILS

Sr.No	As per Tamilnadu govt. Land classification	Area in Ha
1	Forest Land	0.00
2	Irrigated Land (patta lands)	1275.52
3	Un irrigated Land (Dry)	2804.01
4	Cultivable Waste (Govt. Tharisu)	25.21
5	Common facility (Govt.Poramboke):	622.86
6	Earmarked for Housing	114.39
	Total land:	**4841.99 Ha**

The existing project area does not fall under CRZ area. There are no National parks, Wild life sanctuary and eco sensitive areas are exists within 10 Km radius of the project boundary. The nearest wildlife sanctuary is Vedantangal Sanctuary at a distance of 100 km in NNE and nearest National Park is Eravikutam National Park present at a distance of 290 km in SW.

The environmental setting of the location is given in table-16

TABLE-16

ENVIRONMENTAL SETTING

Item	Description	Distance
Nearest Highway	State highway No.10	7.0 km, N
Nearest Railway station	Neyveli	7.8 km, N
Nearest Air port	Tiruchchiraplli	(110 km, SW)
Nearest Air port (international)	Chennai	220Km NNE
		(1.0 km, W)
Nearest town	Vadalur	(9.8 km, NE)
Nearest Water bodies	**Seasonal Rivers**	
	Vellar Seasonal River	Adjacent (S)
	Manimukta Seasonal Nadi	adjacent W-NW
Ecological Sensitive Zones within 15 Km from M.L. Boundary		Nil
National Parks/ Wild life Sanctuaries within 15 Km from M.L. Boundary		Nil
CRZ		Nil
Historical Places within 15 Km from M.L. Boundary		Nil
Any other Industrial Establishments		Nil
Nearest Forest Blocks	Reserve Forests:	
	Narumanam RF	2.8 km, NNW
	Semakkottai RF	5.5 km, N
	Ammeri RF	4.1.km, N
	Siluvachcheri RF	10.4 km, SSW
	Tirukkuram RF & Extension	11.8 km, SSW
	Pilakurichchhi RF & Extension	11.5Km, SW

The nearby water body present in the study area is given in Table-17

TABLE- 17

DISTANCE AND DIRECTION OF Water body

Water bodies Name	Distance/ Direction
Vellar Rajan Channel	2.2 km, E-SE
Vellar Seasonal River	0.2Adjacent , S,SE
Manimuktar Nadi	0.2Adjacent, W
Periya Odai	0.8 km, SW
perumaler Water body	14.4 km, E

4.5 Existing Infrastructure

NLCIL has some facilities with the nearest open cast mines. However, NLCIL will provide the infrastructure necessary for its operations and for the well-being of its workforce. NLCIL is already having Township with facilities at Neyveli. NLCIL will provide infrastructure

improvement for the local community through CSR Scheme. Infrastructure provided to the surrounding people are roads, workshops and stores, water management structures and machinery, potable and industrial water supplies, offices, communications and transport to and from work for most employees.

4.6 Soil classification

The study area is covered with Quaternary alluvium formations exposed in the entire area followed by Cuddalore formation. The alluvial formation mainly comprises of brown clay, sandy clay and sand. The Cuddalore formation is mainly consisting of argillaceous and arenaceous sandstones. The ferrugeneous sandstones intercalated with clays and sandy clays of variegated nature is followed by unconsolidated sandstone/sand. A typical soil of this area shows the following grain size distribution in the **Table - 18**.

TABLE-18

PROPERTIES (GRAIN SIZE DISTRIBUTION) OF SOIL SAMPLE B.H HS-III-2

Depth from Ground surface in m	Soil Description	Grain size distribution (%)		
		Gravel	Sand	Silt/clay
0.00-0.50	Top soil	0	18	82
18.20-18.50	Silty clay	0	22	78
40.00-40.50	Sandy silt	0	30	70
41.00-42.00	Sandy clay	0	28	72
42.00-42.50	Sandy clay	0	32	68
43.00-43.50	Sandy clay	0	36	64
44.00-45.50	Sandy clay	0	30	70

This grain size distribution indicates that the Silt/clay content is unfavourably high and will thus be impedimental for proper root development. Special care has therefore to be taken when these soils are graded after dumping on top of the inside dump, so that no unnecessary compaction is exercised on these soils. This can only be achieved by grading these soils with rather light tractors with oversized broad tires. In case the clay content is even higher the admixture of sand has to be taken into account.

4.7 CLIMATIC DATA FROM SECONDARY SOURCES

The climate of this region is mainly tropical type and is influenced by the conditions in Bay of Bengal. However, the real monsoon months are October to December when the area is influenced by the North-east monsoon. The long-term data in respect of various meteorological parameters are monitored by NLCIL.

The area Secondary information on meteorological conditions has been collected from the Centre for the Applied and Research Development (CARD) of NLCIL. Data of 15 years (2001-2016) has been collected and analyzed. Wind speed, temperature, relative humidity is measured twice a day.

TABLE-19

CLIMATOLOGICALLY DATA STATION: CARD, NEYVELI (2001-2016)

Month	Wind speed in km per hr		Temperature (^{0}C)		Relative Humidity (%)	
	08:30	14:30	Max.	Min.	08:30	17:30
January	4.8	4.6	29.7	20.8	83.0	62.8
February	3.8	4.5	31.7	21.7	81.0	57.9
March	3.2	4.0	34.2	24.0	79.0	54.8
April	4.4	4.1	36.2	26.7	73.9	56.3
May	4.8	4.2	37.7	27.4	68.1	49.3
June	4.3	5.0	36.9	26.9	65.8	48.7
July	3.6	4.5	36.0	26.4	69.8	50.6
August	3.5	3.8	35.2	25.9	73.0	54.4
September	2.9	3.1	34.2	25.5	76.2	60.9
October	2.9	3.2	32.0	24.7	82.7	73.1
November	4.7	4.0	29.4	23.0	85.7	77.4
December	6.0	5.1	28.8	21.5	84.1	71.8
Average	**4.1**	**4.2**	**33.5**	**24.5**	**76.9**	**59.8**

4.7.1 Temperature & Wind Speed

The climate of the region is tropical. March to June is summer followed by south-west monsoon (July to September). However, the real monsoon months are October to December when the area is influenced by the North-east monsoon. The proposed area falls in cyclonic belt with wind velocity generally varies from 10 km/hr to 70 km/hr. However, during cyclonic period the velocity may reach up to 100 km/hr. Maximum wind velocity recorded is 160 km/hr. January to June is the driest part of the year with occasional scanty rainfall. Maximum monthly average temperature is in the month of May with 37.7^{o}C and minimum is in the month of January with 20.8^{o}C. During monsoon, the temperature varies between 20^{o}C and 25^{o}C.

4.7.2 Rainfall

Rainfall is mostly influenced by the north east monsoon (October to December) and lesser extent by south-west monsoon (July to September). The rainfall data of Mine-II were taken for analysis as it is nearest proximity to the proposed Mine-III. The average annual rainfall (1981-2015) recorded is 1496.71 mm, of which about two-third is contributed by north-east retreating monsoon, during October – December. The wettest month is October and November when there are more rainy days. The average rainy days in a year is 93.00 days. In the past 35 years the highest rainfall recorded was 435mm on 09.11.2015 and the highest rainfall in a year was recorded as 2194 mm. The Table shows the rain fall pattern during the period 1981 to 2015.

TABLE:20

RAIN FALL MONTH WISE TOTAL IN MM WITH TOTAL RAINY DAYS

(1981 TO 2015) (RAIN FALL STATION: MINE-II)

Rain Fall Month wise Total in mm with Total Rainy Days (1981 To 2015)

(Rain Fall Station: Mine-II)

YEAR	MONTH												TOTAL	No of Rainy days
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC		
1981	-	-	-	-	42	58	209	183	275	263	113	66	**1209**	72
1982	-	-	-	5.25	36	29	58	46	126	99	386	58	**841**	63
1983	-	-	-	-	58	72	34	220	191	173	105	**449**	**1302**	72
1984	24.25	226.5	87.25	-	3	13	178	66	287	109	180	80	**1253**	87
1985	128.5	-	-	-	72	147	206	214	284	179	**406**	151	**1786**	77
1986	165.62	81.8	50.8	30	69	87	51	106	174	245	175	166	**1401**	119
1987	0.5	-	34.6	40	17	59	44	156	247	179	148	270	**1220**	103
1988	1.5	-	0	119.8	83	28	116	**404**	275	57	206	64	**1355**	82
1989	3	0	1.8	0.1	16	41	160	22	215	252	385	91	**1187**	99
1990	92.8	68.4	66.4	2.4	74	74	35	222	160	256	190	62	**1304**	122
1991	5.4	17	0	7.2	-	87	22	148	120	303	**593**	12	**1314**	87
1992	4.2	-	-	2.2	121	95	55	37	276	182	372	155	**1300**	109
1993	-	29	-	-	42	99	173	99	150	**407**	407	316	**1722**	108
1994	4.4	73.1	-	9.55	28	98	78	222	153	220	394	97	**1377**	108
1995	64.1	11	23.6	0	193	105	126	97	278	205	146	3	**1252**	103
1996	-	-	-	60	33	325	24	199	133	158	219	**860**	**2010**	88
1997	7	-	-	17	56	81	40	139	171	146	**582**	469	**1709**	102
1998	1.2	3.4	-	-	65	22	157	230	178	203	**429**	339	**1628**	94
1999	0.6	5.2	-	51.7	184	76	118	172	72	306	**455**	106	**1552**	86
2000	25.7	165.2	-	35.7	38	46	69	47	187	287	326	233	**1460**	93
2001	2.5	-	-	57.2	107	39	170	102	175	240	176	79	**1147**	79
2002	46.8	169.6	-	-	59	96	90	12	147	**437**	103	78	**1238**	68
2003	-	-	-	4.4	42	39	199	227	31	307	282	-	**1132**	68
2004	3.1	1	-	-	566	43	50	128	313	**565**	190	7	**1865**	85
2005	-	3.4	-	105.2	192	10	42	189	389	206	571	304	**2011**	80
2006	3.1	-	27.8	6.8	74	51	90	146	146	**500**	261	68	**1390**	86
2007	-	9.8	-	88.7	57	62	209	203	127	**579**	71	349	**1755**	83
2008	71.2	30.6	236	0	166	59	118	239	219	230	**607**	136	**2113**	83
2009	7.5	0	39.6	27.2	73	43	82	161	151	105	**622**	215	**1526**	86
2010	45.4	0	0	37	57	114	37	142	181	272	**647**	341	**1874**	116
2011	42.6	21.7	0	157.1	21	8	136	373	292	363	**532**	112	**2057**	103
2012	3.5	0	2.2	34.1	19	3	107	185	214	**423**	1	4	**995**	62
2013	-	54.8	9.8	7.3	16	104	53	319	267	172	242	81	**1327**	86
2014	-	16.6	-	-	214	35	92	252	104	335	244	74	**1366**	89
2015	9.6	0	0	85.9	124	107	211	171	27	149	**880**	367	**2132**	102

4.8 Social Infrastructure Available

Socio-economic aspects of people will be covered in the proposed Social Impact study (SIA). Social infrastructure like road and rail, communication, health, sanitation, community centers, education, financial institutions, income source, etc. are well established due to the presence of NLCIL.

Social Infrastructure available in this area are

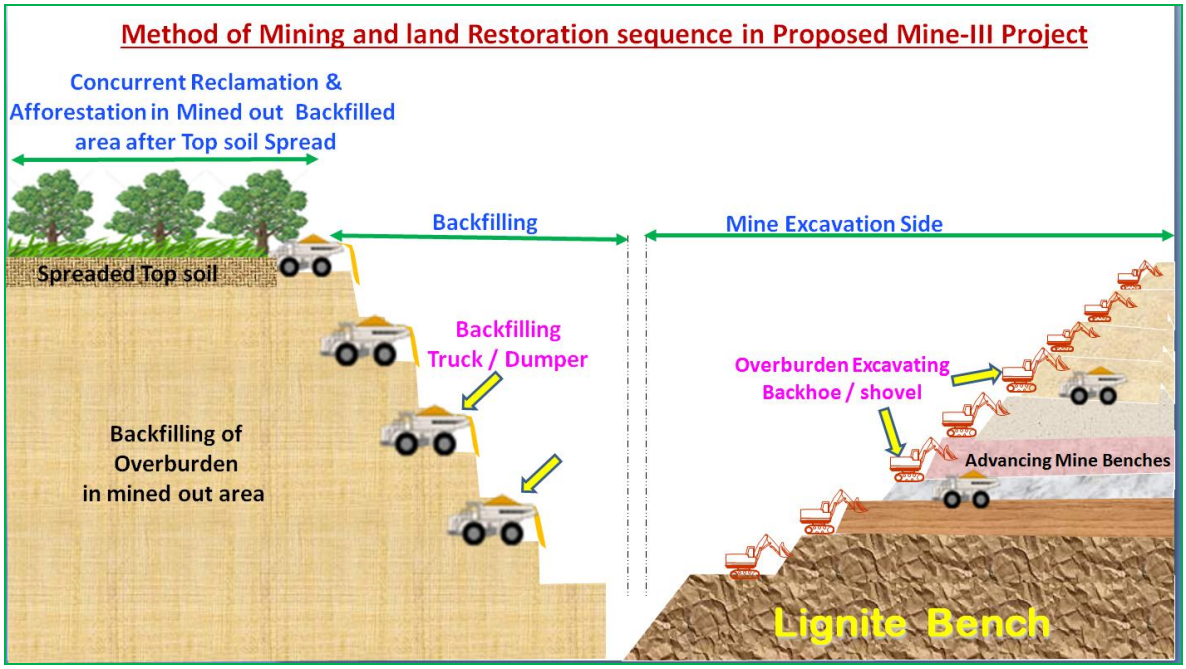
- ✓ Well connected Road to District and State head quarters
- ✓ Power supply network and communication network
- ✓ Hospital
- ✓ Clubs for social interactions and recreation
- ✓ Bank facility and ATM counters
- ✓ Schools

- ✓ Parks
- ✓ Necessary market facilities and shops
- ✓ petrol bunk

5.0 Planning brief

5.1 Mining Method:

The Mining method practiced at Neyveli is shown in the picture. In mine-III project, shovel / Backhoe will be deployed in the advancing benches. The excavated overburden will be spread back by using dumpers in the mined out area as shown in the picture below. After Top soil spread, the backfilled area will be biologically reclaimed and afforested to restore to pre-mining condition.



5.2 Design criteria:

Sequential mining suited for achieving the objective of placing maximum possible OB in the internal dumps. Thus external dump quantities from this pit will be minimized. The following design criteria have been considered for waste dumps.

i) Separate spoil dumps are proposed for Topsoil and hard OB
ii) Maximum height of topsoil dump is to be 10 meters.
iii) Overburden will be dumped in external dump in 30 m decks and up to a maximum height of 60 to 90 meters.
iv) Dump slope for each deck will be maintained at 28^0. Track dozers will be deployed for shaping the dumps. Benching the dump and plantation over the dump will help in better stabilization of dumps and reduction of soil erosion.

v) Internal dumping of overburden will be carried out in 20-30 m height benches.

vi) Dump slope for each deck to be at natural repose of 37.5 Degree and overall slope of the dump at 28^0.

5.3 Mining Parameter

Considering the geo-mining characteristics of the deposit, the mine is proposed to be worked by Conventional Mining Equipment (CME) Technology (Shovel /Backhoe -Dumper system). All the overburden/parting is proposed to be excavated by shovel/ dumper combination. The lignite horizons is proposed to be extracted by hydraulic shovels/backhoes and transported to Lignite Stockyard by rear dumpers. The proposed mining system parameters for various formations are in the Table-20 and Table-21.

TABLE-20
SYSTEM PARAMETERS FOR WASTE

Sr.No	Particulars	Unit	Value
1.	Bench height	M	Upto 10
2	Working bench width	M	Upto 40
3	Non-working bench width	M	25
4	Bench slope	Deg	70
5	Blast hole dia, if required	mm	100-115
6	Inclination of blast-holes	-	Vertical
7	Powder factor	Kg/cum	≤0.125

TABLE-21
SYSTEM PARAMETERS (LIGNITE WINNING OPERATION)

Sr.No	Particulars	Unit	Value
1	Bench height	M	Upto 10
2	Working bench width	M	Upto 40
3	Bench slope	Deg	70

a. No of annual working days 365

b. No of daily shifts 3

c. Duration of shift, hours 8

Annual productivity of excavators is based on the following considerations apart from the above design criteria:

a. Hardness of OB & Lignite

b. Specific gravity of OB & Lignite

c. Swell factors of OB & Lignite

d. Availability of HEMM

e. Utilization of HEMM

5.4 Main Mining Equipment:

The tentative peak requirement of main mining equipment to be deployed in the project for achieving the target capacity of lignite production is as follows, given in the **Table-22**. The finalized Mining equipment configuration will be arrived during preparation of Mining Plan / Feasibility Report.

TABLE-22
MAIN MINING EQUIPMENT

Sr.No.	Equipment	Size	Population
Overburden			
1	Hydraulic Shovels/ backhoes	10-12 cum	18 to 21
2	Rear Dumpers	100 T	102 to 109
3	RBH drills	100-115 mm	6
4	Dozers	320 HP	20
Lignite			
1	Hydraulic backhoe	10-12 cum	3
2	Rear Dumpers	100 T	15
3	Wheel Dozers	350 HP	5
Common			
1	FE Loader	5-6 cum	6
2	FE Loader	1-2 cum	6
3	Dozers	320 HP	1
4	Water Sprinkler	28 KL	6
5	Hydraulic Backhoe	1.0 cum	4
6	Tipping Trucks	10 T	4
7	Mobile Cranes	40/18/8 T	4

5.5 Blasting:

Main overburden comprises of clay, sandstone/clayey sandstone, which are friable in nature. Hard strata will be loosened by using selective blasting. Six nos. of 100-115 mm. drills have been provided for drilling of blast-holes in the hard OB bands, wherever encountered.

The standard practice involving the electric detonators for the initiation of detonating cord, detonating relays to achieve hole to hole delays, use of site mixed slurry explosive, slurry or emulsion explosives as the column charge will be used for Blasting if required.

5.6 Blasting Pattern

A powder factor 0.125 to 0.167 kg/m3 of waste (average: 0.143 kg/m^3) is applicable, depending on rock conditions. Slurry / Emulsion Explosives are used. Rows of holes will be initiated through delay detonation of 25 to 50 milliseconds. Drill hole spacing would be 5m by 5m to 7m by 7m based on strata condition.

5.7 Population Projection

The average daily attendance required to achieve the rated production of 11.50 MTPA is estimated to be around 275. After considering absenteeism towards authorized leave, sick etc., the men on roll for the project will be around 300.

Local personnel including Project affected people will be mostly engaged in unskilled, semi skilled categories. These people need training and orientation before engaging in the project works. Besides, some I.T.I. qualified young people from the region will also be engaged in operation and maintenance of plant and machineries after proper training. The engagement of project affected people / local people in primary and secondary sectors of project shall upgrade the prosperity of the region.

5.8 LAND USE PLANNING (BREAK UP ALONG WITH GREEN BELT ETC.)

The land requirement for Mine-III lignite project is 4841.99 Ha. The entire area falls under the category of non-forest land.

The existing Land-use breakup of the project is presented in the **Table-23.**

TABLE-23

PRESENT LAND USE DETAILS

Sr.No	As per Tamilnadu govt. Land classification	Area in Ha
1	Forest Land	0.00
2	Irrigated Land (patta lands)	1275.52
3	Un irrigated Land (Dry)	2804.01
4	Cultivable Waste (Govt. Tharisu)	25.21
5	Common facility (Govt.Poramboke):	622.86
6	Earmarked for Housing	114.39
	Total land:	**4841.99 Ha**

The post mining Land-use breakup of the project is shown in the below Table-24.

TABLE-24

POST MINE LAND USE BREAK-UP

Sr.No.	Post Mining Land use	Area in Ha
1	External OB Dump (Reclaimed with plantation)	688.00
2	Mine Backfilled area (Reclaimed with plantation)	3014.00
3	Mine Final void (Converted as Lake)	353.00
4	Green Belt (With plantation):	124.00
5	Infrastructure	153.49

6	Inspection Road around the Mine (With Avenue trees)	25.00
7	Intervening area (Brought under plantation)	139.50
8	Garland canal & Drainage	157.00
9	Safety Zone (Brought under plantation)	188.00
	Total land	**4841.99 Ha**

5.9 Assessment of Infrastructure Demand (Physical & Social)

The area is very well developed due to the operating projects of NLCIL. All required infrastructure is available in the vicinity of the mining block. The mining activity has created huge direct / indirect employment opportunity in this region.

5.10 Amenities/Facilities

All the necessary amenities like schools, hospitals, communication, roads, Community centres etc. are available in the existing township.

6.0 PROPOSED INFRASTRUCTURE

NLCIL, as owner and operator of the Mine-III opencast mine will provide the necessary infrastructure for its operations and for the well-being of its workforce.

6.1 Industrial Area (Processing Area)

Lignite Stockyard, Crusher, Site Office, First Aid centre, Heavy Vehicle Repair shed are some of the proposed infrastructure at Mine site.

6.2 Residential Area (Non Processing Area)

There is a Residential Colony present in the Neyveli Township. The Residential Colony is already equipped with fully serviced accommodation units for different class of employees. All the units have power, communication, potable water supply, and sewerage and garbage collection facilities. The Residential Colony also contains the Bachelor's Hostel as well as Recreation Facility for all employees. The Residential Colony also has provision of garden and green belt along the periphery.

6.3 Green Belt

The greenbelt will be developed along the safety zone of mine boundary. Outside dump and inside dump area will be reclaimed and afforested in phased manner.

The areas considered for plantations are:

- Along the haulage road.
- Periphery of the Mine
- Non-mineral bearing areas.

- Completely worked out and refilled areas.

6.4 Social Infrastructure

For the villages in around the Mine-III permanent roads laying works shall be taken from time to time by the company.

- Drinking water

Bore wells will be established under pheripheral development scheme in the villages in and around the Mine-III to cater the need of drinking water.

6.5 Connectivity

Road

Neyveli Lignite Mine-III is well connected by roads to Chennai (230 Kms due North), Cuddalore (40 Kms due east), Kumbakonam (70 Kms South) and Vridhachalam (15 Kms West). All the villages are within the ambit of mining area are interlinked by asphaltic and metalled roads.

Railway Line

The nearest railway Station is Neyveli (7.8 Km North) which is located on the Cuddalore-Vridhachalam Section of Southern railway.

Air Link

The nearest International air port is at Tiruchirapalli at a distance of about 112 km.

6.6 Drinking water management (source & supply of water)

Industrial water required for washing, sprinkling on Mine-III roads for dust suppression and for watering the Mine-III site plantations, will be supplied from pumping installation at Mine-III storm / seepage water sump.

The drinking water will be supplied from bore well. The drinking water will be stored in overhead tank near the facilities area and distributed through pipe lines to different facilities area for drinking and domestic purposes.

6.7 Sewerage System

The required sewage treatment plant will be established for domestic and Industrial purpose.

6.8 Industrial waste management

Domestic and service building effluents will be treated in septic tank followed by soak pits. Seepage Mine water will be allowed to settle down in settlement tanks and pumped out for irrigation. Topsoil will be handled separately to allow for restoration of soil cover in the inside and External Dumping areas. The other excavated overburden will be filled back in the mineral exhausted area.

6.9 Solid waste management

Sequential mining suited for achieving the objective of placing maximum possible OB in the internal dumps. Thus external dump quantities from this pit will be minimized. The following design criteria have been considered for waste dumps.

i) Separate spoil dumps are proposed for Topsoil and hard OB
ii) Maximum height of topsoil dump is to be 10 meters.
iii) Overburden will be dumped in external dump in 30 m decks and up to a maximum height of 60 to 90 meters.
iv) Dump slope for each deck will be maintained at 28^0. Track dozers will be deployed for shaping the dumps. Benching of Dump and plantation cover will help in better stabilization of dumps and reduction of soil erosion.
v) Internal dumping of overburden will be carried out in 30 m high.
vi) Dump slope for each deck to be at natural repose of 37.5 Degree and overall slope of the dump at 28^0 -.

6.10 Power Requirement & Supply / Source

The incoming Power supply for Lignite Mine-III is proposed to be availed from the nearest NLCIL Power source. Mine Sub Station 230/11 kV with two transformers of 2 X 30 MVA power is tentatively envisaged for Mine-III project. Lignite Handling Plant including crushing & material handling facilities, mine dewatering, workshop, offices, etc. add to the total power demand of the project.

7.0 REHABILITATION AND RESETTLEMENT PLAN

Rehabilitation and Resettlement (R&R) plan will be submitted after completion of SIA study. About 5927 families are expected to be resettled. 489.43 Ha. of land is envisaged for formation of Re-settlement centres for displaced persons at T.Gopurapuram, Chinnapandarankuppam. Kanathukandan, Erumanur villages at Vridhachalam Taluk, Cuddalore District. Suitable R&R measures will be provided as per applicable laws and guidelines of state and Central Government. Free Eye camp, health check up camps, provision of water supply, road repairing will be extended to surrounding villages including displaced persons under CSR.

8.0 PROJECT SCHEDULE & COST ESTIMATES

The life of the project is 35 years for the targeted production of 11.50 Mt/annum. The tentative Mine project capital cost is about Rs 1150 Crores. After obtaining necessary approvals like Environment clearance, Mining plan approval etc, the project will be commissioned.

The **table-25** shows the Tentative yearwise Production schedule:

TABLE-25

Year	Overburden (Mm^3)	Lignite (MT)
1	46.05	0.0
2	77.00	8.75
3	77.0	11.50
4	77.0	11.50
5	77.0	11.50
6	77.0	11.50
7	77.0	11.50
8	77.0	11.50
9	77.0	11.50
10	77.0	11.50
11	77.0	11.50
12	87.0	11.50
13	87.0	11.50
14	87.0	11.50
15	87.0	11.50
16	87.0	11.50
17	87.0	11.50
18	87.0	11.50
19	87.0	11.50
20	87.0	11.50
21	87.0	11.50
22	87.0	11.50
23	89.0	11.50
24	89.0	11.50
25	89.0	11.50
26	89.0	11.50
27	89.0	11.50
28	89.0	11.50
29	89.0	11.50
30	89.0	11.50
31	89.0	11.50
32	89.0	11.50
33	89.0	11.50
34	89.0	11.50
35	41.03	10.12
Total	**2882.08**	**386.87**

9.0 ANALYSIS OF PROPOSAL (Final Recommendations)

Economic development of the region depends largely upon the nature of activities undertaken in the surrounding region. Corporate development invariably contributes towards acceleration of the process of socio-economic uplift of the rural society.

The Lignite is the only available fossil fuel in Tamil Nadu. The proposed Opencast Lignite Mine in Mine-III Block by NLC India Limited with initial mining capacity of 11.50 MTPA is proposed to supply Lignite to the Thermal Power station-II 2nd expansion of NLCIL. **The power project will boost the Industrial production of Southern States and improve the economy of the nation.**

The land affected persons will be given priority for engagement in the project works with minimum wage protection as per applicable rules and guidelines apart from payment of compensation for lands as per Act and as per Government norms. This will improve the economic condition of the project affected / local people. The engagement of project affected / local people in primary and secondary sectors of project related works shall upgrade the prosperity of the region.

The details of benefits to the land affected persons and other people in the adjoining villages are given below:

- Employment
- Educational facilities
- Medical facilities
- Infrastructure facilities
- State exchequer
- Vocation training centres
- Residential facilities

Annexure-I Copy of Neyveli Lignite Field Lease (259 Sq.Km / 100 Sq.mile)

G.O

Office of the General Manager,
Geological Exploration & Consultancy
F-39, J. N. Salai, Block-25, Neyveli-I
Tamil Nadu PIN - 607 803

GOVERNMENT OF TAMIL NADU

Abstract

MINES AND MINERALS - Mining Lease - Lignite - Cuddalore District - Vridhachalam, Panruti and Chidambaram Taluks - Over an extent of 259 sq.kms. covering 69 villages - Second renewal of mining lease application filed by Tvl.Neyveli Lignite Corporation Limited, Neyveli - Orders - Issued.

INDUSTRIES (MMA.I) DEPARTMENT

G.O.Ms.No.636 Dated 3rd August, 1999.

Read:-

1) G.O.Ms.No.4258, Industries dated 29.8.63.
2) G.O.Ms.No.109, Industries, dated 21.4.94.
3) Letter (Ms) No.253, Industries Department dated 16.9.94.
4) From M/s.Neyveli Lignite Corporation Limited, Second renewal application dated 4.12.95.
5) From the District Collector, Cuddalore, Letter No.13/G&M/262/95 dated 2.5.99.
6) From the Commissioner of Geology and Mining, Lr.No.3189/MM1/99 dated 13.5.99.
7) Government Lr.No.31228/MMA1/98-9, Industries dated 7.6.99.
8) From the Government of India, Ministry of Coal, New Delhi, Lr.No.48024/3/99 dated 23.7.99.

ORDER:

In the Government Order first read above, Government have granted a mining lease to Neyveli Lignite Corporation Limited for mining Lignite, China Clay, Ball clay and fire clay over an extent of 100 sq.miles (259 sq.kms) in parts of Vridhachalam, Cuddalore and Chidambaram taluks of the then South Arcot District for a period of 20 years with effect from 6.12.1956. In the Government Order second read above, Government have granted first renewal of mining lease to Neyveli Lignite Corporation Limited for a period of 20 years from 6.12.76 over an extent of 239 Sq.kms. in 69 villages excluding 20 sq.kms. which form a narrow corridor on the western most fringe of third mines falling in 9 villages. Subsequently, in the letter third read above in partial modification of the orders issued in the above Government Order, the first renewal was granted over an extent of 259 sq.kms. as originally sanctioned in G.O.Ms.No.4258, Industries dated 29.8.63 for a period of 20 years from 6.12.1976. The period of lease expired on 5.12.96.

2. M/s.Neyveli Lignite Corporation Limited have now filed a second renewal of mining lease application in time on 4.12.1995 for grant of renewal of mining lease over an extent of 259 sq.kms.

/2/

for a period of 20 years from 5.12.96 to 5.12.2016. In this connection, Neyveli Lignite Corporation Limited has furnished the following documents:-

1) Affidavit with reference to settlement of arrears Local cess and Local Cess Surcharge on royalty from 27.6.90 to 4.4.91.

2) Mining due certificate.

3) Map showing the lease hold area of Neyveli Lignite Corporation Limited and the area of acquisition so far made by Neyveli Lignite Corporation Limited.

3. The District Collector, Cuddalore District has recommended the second renewal of mining lease application of M/s.Neyveli Lignite Corporation Limited.

4. The Commissioner of Geology and Mining has also recommended the second rebewal of mining lease application of M/s.Neyveli Lignite Corporation Limited for grant of mining lease over an extent of 259 sq.kms. comprised in 69 villages of Vridhachal Chidambaram and Panruti taluks in Cuddalore District for mining lignite, Ball clay, fire clay and silica sand for a period of 20 years from 6.12.1996 subject to certain conditions.

5. The Government of India, Ministry of Coal, in their letter eighth read above have conveyed their approval under section 5(1) of the Mines and Minerals (Regulation and Development) Act, 1957 to the grant of mining lease to Neyveli Lignite Corporation Limited over an extent of 259 sq.kms, in parts of Vridhachalam, Panruti and Chidambaram taluks of Cuddalore District for a period of 20 years effect from 6.12.96 and under Rule, 24(a)(7) of Mineral Concession Rules, 1960 for grant of second renewal of mining lease for the above areas. The Government of India have also conveyed their approval to the mining Plan for Mine 1A of Neyveli Lignite Corporation Limited under section 5(2)(b) of the Mines and Mineral(Regulation and Development) Act, 1957 and sent a copy of the letter dated 23.7.97 duly approved and authenticated by the Central Government. In vi of this, the Government of India have informed that prior approval of Government of India for relaxation of section 5(2)(b) of Mines and Minerals (Regulation and Development) Act, 1957 will not apply.

6. In the circumstances stated above, Government have decided to accept the recommendation of the District Collector, Cuddalore and the Commissioner of Geology and Mining and decided to grant the second renewal of mining lease in favour of Tvl.Neyveli Lignite Corporation Limited, Neyveli to mine Lignite, ball clay, fire clay, china clay and silica sand over an extent of 259 sq.kms. covering 69 villages in Vridhachalam, Panruti and Chidambaram taluks of Cuddalor District for a period of 20 years with effect from 6.12.1996.

/3/

/3/

7- In exercise of the powers conferred under section 10(3) of the Mines and Minerals (Regulation and Development) Act 1957 the Governor of Tamil Nadu hereby sanctions the grant of second renewal of mining lease in favour of Tvl.Neyveli Lignite Corporation Limited, Neyveli to mine lignite, Ball clay, fire clay, china clay and silica sand over an extent of 259 sq.kms. covering 69 villages in Vridhachalam, Panruti and Chidambaram taluks of Cuddalore District for a period of 20 years with effect from 6.12.96 subject to the following conditions and also other usual conditions specified in the Appendix to this order.

i) Necessary transport permits and despatch slips are obtained for the minerals granted under mining lease by Neyveli Lignite Corporation Limited from the concerned Authorities. Silica Sand should be separately mined by suitable mining methods and stocked and removed for disposal.

ii) There should be strict observation for the provisions of the Minerals Act, particularly relating to the safety distance pertaining to permanent structures in railway line, highways etc.,

iii) An undertaking to be obtained from the Neyveli Lignite Corporation Limited to preserve the Ecology. No area in the lease hold is sold or let out or transferred without prior consent of the State Government.

8. The rates of royalty, dead rent and surface rent shall be as follows:-

I Royalty

Lignite:- Rupees Two rupees and fifty paise per tonne.

Fire clay Seventeen Rupees per tonne.

Ball clay, China clay:- Also called Kaolan and white shale

a) Crude Eighteen Rupees per tonne.

b) Processed(including washed) Sixty eight rupees per tonne

II) Dead Rent:

First year of the lease	:	Nil.
Second to fifth year of the lease.	:	Rs.120/-(Rupees one hundred and twenty only) per hectare.per annum.
Fifth year to tenth year of the lease.	:	Rs.200/-(Rupees Two hundred only) per hectare.per annum.
Eleventh year of the lease and onwards.	:	Rs.300/-(Rupees Three hundred only) per hectare.per annum.

/4/

The rates of royalty and dead rent are subject to such changes as may be notified from time to time.

Surface rent and water rate:

At such rates as the land revenue and other cesses and surcharge assessable on the land shall be paid.

9.The applicant should pay a deposit of Rs.2,000/- (Rupees Two thousand only) as prescribed in rule 32 of the Mineral Concession Rules, 1960 before the lease deed is actually executed.

10.The terms and conditions mentioned in this order are subject to such further modifications, additions and alterations as may be included in the lease deed when finalised.

11.The District Collector, Cuddalore is requested to take necessary further action for execution of the lease deed in the prescribed form after satisfying the conditions mentioned in para 7 above. He is requested to report the date of execution of the lease deed to the Government and the Commissioner of Geology and Mining as soon as the lease deed is executed. The Collector of Cuddalore is also requested to ensure compliance of the amended provisions of the Mines and Minerals(Regulation and Development) Act, 1957 and other applicable Acts and Rules including Forest (Conservation) Act, 1980 by the lessee before the lease deed is executed.

12.The copy of the Mining Plan duly approved by the Government of India and assessment and Environmental Management Plan of Neyveli Lignite Corporation Limited are returned herewith.

(By order of the Governor)

M.S. SRINIVASAN
SECRETARY TO GOVERNMENT

To
The District Collector, Cuddalore.(We)(By RPAD)
The Commissioner of Geology and Mining, Chennai.32.
Tvl.Neyveli Lignite Corporation Limited, Neyveli.607801.(w.e.)
The Secretary to Government of India, Ministry of Coal, New Delhi.
The Regional Controller of Mines, I.B.M., C4A, CGO Complex, Besant Nagar, Chennai.20.
Copy to the Industries (OP.II) Department, Chennai.9.
Copy to Chief Minister's Office, Chennai.9.
Copy to Stock-file.

forwarded/by order

Section Officer

3.8.99

S.V.3.8.99.

3/8/99

APPENDIX

The transport permit (with despatch slip, if necessary in the case of bulk permits) may be issued at the request of the lessee or collection as royalty for the quantity of mineral mined from the leasehold area and ready to be transported. No Bulk permit for larger quantity in anticipation of mining of the minerals should be issued, as this may lead to advance collection of royalty which was objected to by the Government of India, unless the lessee is willing to pay in advance for his own convenience. The accounts relating to the collection of actual royalty or dead rent should be reconciled at the end of the year before 10th January of the succeeding year.

2.The lessee shall pay before the expiry of the lease it or sooner determination by either part of amount equal to the annual dead rent or such high amount as may be fixed by the Collector of the District in his discretion as compensation for damage to the land covered by the lease;

3.The lessee shall not fellol frees, if any, without the previous permission of the Collector and if it is found that the has fell any trees and the value of such trees etc.,shall be paid for by the lessee at rates to be fixed by the District Forest Officer, together with a compounding fee subject to a maximum of ten times the value of the said trees; without such permission be shall pay the value, of the trees.

4.The lessees shall not operate on the surface of any area prohibited by any authority by laining out roads, erecting building, machinery etc. without the previous permission of such authority of the State Government.

5.The lessee shall not use land for surface occupation without giving proper notice to the Collector.

6.The lessee shall provide and shall keep at all times at or near the pit head full equipment of weighing machines or modern type to the satisfaction of the collector for weighing the minerals collected by him;

7.The lessee will exercise the liberties and powers hereby granted in such manner as to offer no un necessary or reasonable avoidable obstruction or interruption to the development and working of any minerals not included in this lease and will at all times afford to the Governor and to the holder of prospecting licences or mining leases in respect of any such minerals or any minerals within any lands adjacent passage upon and across the said lands to such minerals for the purpose of getting, working, developing and carrying away the same;

8.The lessee shall take such precautions as are necessary to secure pits and shafts by putting up wire fencing or such other protection to the satisfaction of the Collector to prevent accidents;

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9. That on the occurrence of any accident the shall report such accident immediately to the nearest station, the nearest factory Inspection and the Labour Commissioner.

10. The lessee shall execute an indeminity bond to the Government against the claims of third parties.

11. The lessee will at the expiration or sooner determination of the said term deliver upto the Governor all mines, pits, shafts, including drifts, levels, waterways, airway sand other work (now existing) thereafter to be sunk or made under the said lands (except such as may have abandoned with the sanction of the Government or in any ordinary and fa courses of working) and all (engine, machinery, plant buildin structures and other work and conveniences which at the commencement of the said terms were upon or under the said la and all) Engines, Machinery, plant and fixtures set by the lessee below ground levels which cannot be removed without causing injury to any mines or works under the said lands (except such of the same as may with the sanction of the Governor have become discussed and all buildings and structure of brick of stone executed by the lessee above ground level in good repair condition and fit in all respects for further working of the said minerals.

12. If after the determination of the lease there shall remain in or upon the said lands any engines, machinery, plant, buildings, structures, transways, railways and other works, erections, and conveniences of minerals or mineral ores sother property which the lessee is entitled to remove from the land the same shall, if not removed by the lessee within one calend month after notice in writing requiring their removal is given to the lessee by the Collector be deemed to become the propert of the Government of Tamil Nadu and may be sold in such manner as they shall deem fit without ability to pay the compensation or to account to the lessee in respect thereof.

13. In the event of existence of state of war or of grav national emergency (of which the President of India shall be the sole judge and a notification to this effect in the Gazette of India shall be conclusive proof the Governor after notice in writing to the lessee under the hand of any Secretary to Government of his intention so to do may forthwith taken possession of assume control of the works, plant and machiner and premises of the lessee at or in connection with the sai mines and may pre-empt at prices fixed by the Governor all the minerals and all products thereon extracted from or lying up the said mines during such possession or control and the les shall confirm and obey all directions given by or on beh of the Governor regarding the use or employment of such works plants premises provided that a fair compensation* paid to the lessee for all loss or damage sustained by reasons or in con sequences of the exercise of the powers shall not determine the said terms hereby granted or affect the terms and provisions of these presents further than may be necessary to give effect to the provisions of this clause.

*which shall be determined by the Governor and shall be

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14.(a) the lessee shall not enter upon or commence prospecting or mining operations in any reserve forest situated upon the said land without thirty days previous notic in writing to the District Forest Officer nor without obtainir any written sanction of that Officer nor otherwise than in accordance with such conditions as that Officer may in his absolute direction prescribed.

(b) the area within the reserved forest limits must be demarcated by a declared fire line of 40 feet width which will be cut and kept cleared by the Forest Department at the expense of the lessee;

(c) the lessee must at all times permit the Forest Department to enter upon the land for the purpose of maintair or repairing existing boundary lines within the area, and must pay the cost of such maintenance of repair as determined by the District Forest Officer;

(d) the lessee must take suitable precausions to preven fire from spreading into the adjoining reserve forest from the land and if such fires accidentally occure he must render all possible assistance in putting them out;

(e) the lessee shall not cut any trees or growth on the area granted in excess of 20 percent of the number of tre on the whole areaunder the lease without the previous permiss of the District Forest Officer, he must not deface or interfere with any boundary stone or marks, if any boundary mark is accidentally damaged he must bring the matter immediately to the notice of the Range Officer.

15. The lessee shall keep the stock of beryl or any other prescribed substance under section 3 of the Atomic Energy Act No.XXIX of 1948, if they occur in the property covered by the lease with a view to making them available to the Governmen of India.

16.Quarterly and Annually returns should be submitted in the prescribed format by the Owner(lessee) Agent or Manager of the Mines to the Directorate of General of Mines Safety, Oorgaum Region, Oorgaum and to the respective Officers.

k. krishnamurthy
SECTION OFFICER 3.8.9

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